

ABSTRACT OF THE DISCLOSURE

A haptic device for human/computer interface includes a user interface tool coupled via cables to first, second, third, and fourth cable control units, each positioned at a vertex of a tetrahedron. Each of the cable control units includes a spool and an encoder configured to provide a signal corresponding to rotation of the respective spool. The cables are wound onto the spool of a respective one of the cable control units. The encoders provide signals corresponding to rotation of the respective spools to track the length of each cable. As the cables wind onto the spools, variations in spool diameter are compensated for. The absolute length of each cable is determined during initialization by retracting each cable in turn to a zero length position. A sensor array coupled to the tool detects rotation around one or more axes.

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